

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

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- 5 1. A method for generating a look-ahead envelope defined, in part by detection offsets for use by an enhanced ground proximity warning system in an aircraft, the method comprising:
- providing a terrain database;
 - receiving a positional fix;
 - determining a database resolution at the positional fix;
 - 10 receiving a ground track;
 - generating a look-ahead envelope based on the received positional fix, data base resolution, and the received heading.
- 15 2. The method of Claim 1, wherein the positional fix includes a positional uncertainty value.
3. The method of Claim 2, wherein generating comprises determining the detection offset based on the value for positional uncertainty.
- 20 4. The method of Claim 3, wherein generating comprises generating a series of detection sub-offsets based on the value for positional uncertainty.
- 25 5. The method of Claim 1, wherein the positional fix includes a distance to nearest runway value.
6. The method of Claim 5, wherein generating comprises generating a side span value based on the distance to nearest runway.
- 30 7. The method of Claim 1, wherein receiving a positional fix comprises receiving a logical signal indicating a low-altitude flight condition.
- 35 8. The method of Claim 7, wherein generating comprises generating a side span value based upon the presence of the logical signal indicating a low-altitude flight condition.
9. The method of Claim 7, wherein generating comprises generating side span value based upon the presence of the logical signal indicating a low-altitude flight condition.

10. The method of Claim 7, wherein generating comprises generating a series of detection sub-offsets based upon the presence of data base high-resolution.

5 11. An enhanced ground proximity warning system in an aircraft comprising:
a data bus configured to receive information from navigational instrumentation including a global positioning system; and
a look-ahead component configured
to receive a positional fix and a ground track from the data bus;
10 to generate a look-ahead envelope defined, in part, by:
detection offsets; and
side span angles.

12. The system of Claim 11, wherein the positional fix further comprises a
15 measure of positional uncertainty.

13. The system of Claim 12, wherein the look-ahead component determines
detection offsets based upon the measure of positional uncertainty.

20 14. The system of Claim 11, wherein the positional fix further comprises a
logical signal indicating a low-altitude flight condition.

15. The of Claim 14, wherein the look-ahead component determines detection
offsets based upon the presence of a logical signal indicating low-altitude flight condition.

25 16. The of Claim 14, wherein the look-ahead component generates a series of
detection sub-offsets based upon the presence of a logical signal indicating low-altitude
flight condition.

30 17. An enhanced ground proximity warning system in an aircraft comprising:
a means for conveying data from navigational instrumentation including a global
positioning system; and
a means for generating a look-ahead envelope based upon
a positional fix received from the means for conveying data; and
35 a heading received from the means for conveying data.

18. The system of Claim 17, wherein the means for generating a look-ahead envelope further bases that envelope upon a measure of positional uncertainty received from the means for conveying data.

5 19. The system of Claim 17, wherein the means for generating a look-ahead envelope further bases that envelope upon a logical signal indicating a low-altitude flight condition received from the means for conveying data.

10 20. A computer program product for use in an aircraft comprising:
a register for receiving navigation data comprising:
a positional fix of the aircraft; and
a ground track of the aircraft;
a look-ahead component configured to generate a look-ahead envelope based on the positional fix of the aircraft and the heading of the aircraft;
15 a database component comprising stored elevations of terrain stored in association with a terrain location for locations along an anticipated flight path;
an alert component configured to determine if an alert condition exists based on the generated look-ahead envelope and the stored elevations of terrain.

20 21. The product of Claim 20, wherein the look-ahead component is configured to generate the look-ahead envelope defined by a detection offset value wherein a width of the look-ahead envelope is based upon the detection offset value.

25 22. The product of Claim 21, wherein the register is further configured to receive a positional uncertainty value and wherein the look-ahead component is configured to generate the detection offset value based upon the positional uncertainty value.

30 23. The product of Claim 21, wherein the register is further configured to receive a logical signal indicating low-altitude flight and wherein the look-ahead component is configured to generate the detection offset value based upon the logical signal indicating low-altitude flight.

35 24. The product of Claim 23, wherein the look-ahead envelope is further defined by a side span value wherein a splay of the look-ahead envelope is based upon the side span value.

